

BIPARIETAL DIAMETER IN INDIAN NEONATES AT BIRTH

by

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Introduction

Accurate knowledge of gestational age is an important requirement for every obstetrician for optimal management of a pregnant patient. Sonar has the capability of providing this information more accurately than any other ancillary method.

Ultrasound is being increasingly used in most of the hospitals.

The following study was undertaken to determine how the ultrasonic B.P.D. (Biparietal Diameter) measurements

from the western countries correlate with the Indian population.

Material and Methods

This study was conducted at the K.E.M. Hospital Bombay, on 300 full term infants, of women with uncomplicated vaginal deliveries. The biparietal diameter of the neonates, was measured with the help of callipers, within 24 hours of birth.

A single ultrasound B.P.D. measurement was done in 25 normal pregnant women after 30 weeks gestation, to determine the expected due date.

Results

TABLE I
BPD Range in Indian Neonates at Birth

Weight in kilograms	No.	MALE		FEMALE	
		B.P.D. Range in CMS.	Mean	No.	B.P.D. Range in CMS. Mean
2.5-2.7	57	8.9-9.4	9.28	56	9.0-9.4 9.21
2.8-3.0	69	9.0-9.5	9.30	51	9.1-9.5 9.32
3.1-3.3	27	8.9-9.5	9.30	19	9.1-9.5 9.36
3.4-3.6	5	9.1-9.5	9.32	6	9.0-9.5 9.32
73.6	4	9.1-9.5	9.40	6	9.0-9.5 9.34

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The range of B.P.D. varied from 8.9 cms. to 9.5 cms. Mean being 9.29 cms. No significant difference in the B.P.D. was seen between male and female infants.

Table II shows the difference between the expected due date (E.D.D.), deter-

mined by ultrasound examination and the actual date of delivery.

TABLE II
Difference between E.D.D. and Actual
Date of Delivery

Difference	No. of women	%
Less than 10 days	4	16
10-14 days	2	8
15-30 days	14	56
More than 30 days	5	20

24% of women showed a difference of 2 weeks or less, while in 86% it was over calculated by more than 2 weeks. All the babies were 2.5 kgm. or over.

Discussion

All embryos start at the same size and it is only with the passage of time that genetic and environmental factors begin to exert their influences on the size of the foetus. Campbell (1974) showed that it was possible to predict the actual date of delivery to within plus or minus 14 days in 93% of cases by sonography in the period covering the 13th to the 30th week.

According to Pederson (1981) male foetuses were on an average larger than female ones at the first measurement in the 8th to the 12th week. Therefore, a genetic rather than a hormonal mechanism is behind the sex difference in size. The levels of Crown-Rump (C-R) length and BPD were on an average 2.0 mm ($P < 0.01$) and 1.4 mm ($P < 0.005$) higher in male foetuses than in female ones. He found no correlation between height of the mother and foetal measurements of C-R length and BPD. Varma (1973) found that by using 2 measurements at an interval of 3 weeks and excluding those babies with an intrauterine growth retardation (IUGR), that 91.2% of

her patients went into spontaneous labour within 9 days of the estimated date of delivery. The potential accuracy of cephalometry in terms of maturity, prediction, declines after the 30th week due to environmental and other factors. However, given a normally growing foetus, by making 2 measurements preferably at 2 weeks interval the absolute increase in size can be composed with the range of expected growth increments at the relevant head diameter (Campbell 1971). A small or no increase would favour a diagnosis of IUGR in advanced pregnancy. According to Hayashi (1981) the use of BPD to assess gestational age is accurate in 93% of the instances. A BPD reading of 9.3 cms was the composite mean reading at 38 weeks gestation. Sabbagha *et al* (1976) give the BPD percentage range at full term as 10.1 cm. at 95th percentile and 9.5 cms. at 50th percentile.

In the present study, the BPD range varies between 8.9 to 9.5 cms., the mean being 9.29 cms. Our babies being smaller, the BPD at birth is less than that of European and American babies. This is a theoretical danger when standards based on European population are used for Indian babies. Indian babies are small not because they are malnourished but are normal in size for their ethnic background.

For correct maturity estimation, the last menstrual date must be available. Unfortunately, large number of women are unable to recollect this date. Apart from amniocentesis, ultrasound is the method which is considerably helpful in determining the maturity of the foetus. Unless we are sure of our standard BPD, we may be misled by foreign charts. No method is infallible.

In oligohydramnios, multiple pregnancy, deep engagement of the head

and maternal obesity reliable untrasound measurements are difficult.

However, for all practical purposes, once two separate biparietal diameters are recognised at 2 to 3 weeks interval, first preferably being done at about 18 weeks, prediction of gestational age for singleton pregnancies may be made, based on BPD tables. A BPD reading of more than 9 cms in Indian babies may be considered as a sign of maturity with a gestation of 38 weeks.

Ultrasound is thus an excellent noninvasive method to determine the maturity of babies, when induction of labour is contemplated.

Summary

The biparietal diameter of Indian neonates at birth is determined, which may help in assessing the maturity of the foetus. A single ultrasonographic measurement at 30 weeks or later is misleading.

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Four hundred and thirty patients from U.S.I. Medical Hospital and other hospitals of Kanpur were selected for the study. A complete history with special reference was taken and a thorough clinical examination to exclude any congenital skeletal abnormality and certain routine investigations were done.

These were then randomly assigned to one of the 5 groups and their measurements were as follows:

- Group I: Intracranial pressure
- Group II: Hyaline and Osteopetrosis
- Group III: Hyaline & Proliferation
- Group IV: Only saline and
- Group V: was left untreated.

Before we report on birth control

Crania is composed mainly of osseous tissue muscle and fibrous tissue alongwith the brain. Below the level of internal table the main component is only fibrous tissue, the main component being only 12% (Dawson, 1971). The stratum contains hyaline cartilage, chondroblasts and two and multiphasic chondrocytes (Vignosa et al 1963). These chondrocytes are the mesodermal "connective" or bridging cells together to form the osseous framework. All these components are deposited by intramembranous ossification (Sternberg 1967).

Reference to literature

Studies in Osteopetrosis and Osteoporosis

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